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Nocturnal flowering of Mentzelia ornata.—Mr. THOMAS MEEHAN said this old species had only just found its way into cultivation, and afforded an opportunity to note its distinctive habits. His nephew, Mr. Joseph T. Meehan, had kindly watched for him, and found that the same flower opened on four successive nights; on the fifth it made a weak attempt to open, but soon faded away. The flower commenced to open soon after sundown (6 P.M.), very rapidly the first day, and commenced closing again in about three hours, becoming entirely closed by midnight. The second night they opened more slowly, and commenced to close earlier, so that the final closing was again about midnight. The last two nights the motion was slower, but occupied about the same time on the whole. Mr. Redfield had noted, Mr. M. observed, that some Mentzelias opened by day and some by night, but he knew of no attempts to time the opening exactly.

In order to tell whether these openings and closings by night had anything to do with fertilization by insect agency, he had inclosed one flower in a gauze bag, and found it to have a seed vessel apparently as perfectly developed as the rest. The seed might possibly be imperfect when the seed vessel was mature, but this was hardly likely, as the instances where plants developed their capsules in the absence of fertilization were uncommon.

SEPTEMBER 19.

The President, Dr. RUSCHENBERGER, in the chair.

Twenty-eight members present.

Notes on the Coniferæ.—Dr. ENGELMANN, of St. Louis, spoke about *Abies Fraseri*, the very local species of the highest mountains of North Carolina, which he had just visited, together with several botanical friends, members of this society. This is the tree which caused these mountains to be designated as the Black Mountains; giving their summits that sombre hue for which they are known. They seem to grow nowhere but on these mountains, and only on those that reach up to or above 6000 feet altitude. The northern localities claimed for the species, rest on confusion with forms of *Abies balsamea*, the common northern balsam, of which our tree may be claimed to be the southern representative. *A. balsamea* does not seem to extend southward further than the Virginian mountain region; and it would be interesting to ascertain how near both species approach each other.

Besides the well-known characters of the cones and their cusps, excellent distinctions are found in the structure of the leaves of both species. It may not be generally known, though it is a fact to which, since several years, some European botanists have called attention, that the anatomical structure of the leaves of these species, as well as of *conifers* in general, are extremely various, and that this structure well characterizes many species, and is one of the safest means to arrange them in natural groups. *Abies Fraseri* and *balsamea* are so nearly allied, that without fruit they are constantly confounded; but the structure of the leaves will always distinguish them so well, that a single leaf, or even a fragment of one, will invariably solve all difficulty. The leaves of *Abies* have under the epidermis, and between it and the cells of the parenchyma, which are full of chlorophyll, an arrangement of cells of thick walls, elongate form, and destitute of chlorophyll, analogous to bast cells, which have been called *hypodermic* cells; we find them in all species of *Abies* on the edges and on the keel, where they strengthen the leaf; but their distribution under the epidermis of the upper side of the leaf is very different in different species—they may be wanting there altogether or may be differently grouped, or may extend over the whole upper surface. Now in all forms of *A. balsamea* they are there almost entirely absent, even in those of the highest New England mountains; while *Fraseri* exhibits under the microscope a continuous hypodermic stratum of them.

These differences may seem minute and perhaps unimportant, but they remind us of similar structural differences in the higher or vascular cryptogams, in which on differences in variation and cell-structure much stress is laid, and justly so; while in higher developed plants the anatomical structure of the leaves is much more uniform.

This leads to another and much more important question, the position of the conifers in the vegetable world.

Conifers are usually placed at the bottom of the dicotyledonous plants, and Cycadeæ with the highest monocotyledons, near the Palms. Now, Robert Brown, more than fifty years ago, has shown that both differ from all other flowering plants, by bearing on open leaf-organs naked ovules; nor are their seeds inclosed in regular fruits, a peculiarity which has procured for them the name of gymnosperms. It must be admitted, however, that to this day the question, though diligently ventilated, is not entirely settled, or, to express it more correctly, gymnospermy is not yet acknowledged by every botanist.

Calling to our aid the investigations in another field of natural science, Palæontology teaches us that the lowest forms appear in the oldest epochs of our globe's history, and that only in the later periods the higher developed forms are found. Now, the fact is, that ages and ages before other flowering plants, angiospermous plants are found, and almost coëtaneous with the earliest cryptogamic land plants—in the Carboniferous and even in the Devonian periods conifers already made their appearance.

As in the development of the mammals, the prototypes of many of the orders are found anterior in their geological age, as well as lower in grade of development; so the conifers, with their exogenous trunk and their often numerous cotyledons, will have to be considered the prototypes of the exogens, while the cycadeæ with endogenous trunk, and unequal or almost single cotyledons, are those of the endogens. Both together, comprised under the general term of gymnosperms, will eventually be acknowledged as a link intermediate between the vascular cryptogams and the flowering plants.

Naturalization of Plants.—Mr. Martindale spoke of the various agencies by which foreign plants have been introduced into the country, also of the manner of their distribution, instancing the case of *Rudbeckia hirta*, L., now very abundant in the eastern section, having been introduced in grass seed from the west. He also mentioned a number of plants that are common on the coast of Virginia and southward, which have been collected in the lower counties of New Jersey, evidently from seed carried by birds in their migrations coastwise.

Within a few years large quantities of ballast have been deposited in the neighborhood of Philadelphia, on which have been collected a large number of plants not found elsewhere in the vicinity. Some of the species occur every year, and in some instances spread into the waste grounds; others have not appeared the second season, although their seeds became fully matured. He stated that this subject of introduction and establishment of foreign plants was becoming of more and more importance, as the geographical distribution of species was being investigated, and where reasons could be assigned, as to the manner of introduction, they give it an additional interest. He had, within a few days, collected, near the mouth of Wissahickon Creek, a plant which had been determined to be *Leonurus glaucescens*. A large number of luxuriant specimens were growing in the locality mentioned, and it appeared to be fully established. The plant is an entire stranger in this part of the country, and he could assign no way by which its introduction might have been effected at this time. It might possibly have been introduced from Siberia, by way of Japan, in some of the materials intended for the Centennial Exhibition.

September 26.

Mr. Edw. S. Whelen in the chair.

Thirty-four members present.

A paper entitled "Remarks on Ptiloris Wilsonii, Ogden," by Jas. A. Ogden, M.D., was presented for publication.